

AMENDMENT TO THE DRAWINGS:

The attached sheets of drawings include changes to Figs. 1-2. This sheet replaces the original sheet for Figs. 1-2.

In Figs. 1-2, the words --(prior art)-- have been added to the legends of the Figs.

**HIT1P060/HSJ920030255US1**

- 6 -

REMARKS:In the Drawings:

The words --(prior art)-- have been added to Figs. 1-2 in the attached replacement sheets. Withdrawal of the objection is respectfully requested.

Claim Objections:

Claim 12 has been objected to. It is believed that the amendment to claim 1 has obviated the objection. Withdrawal of the objection is respectfully requested.

Claims 1, 4-9

Claims 1 and 4-9 have been rejected under 35 USC 102(e) as being anticipated by Hasegawa et al. (2004/0072021A1).

For reference publications and patents of patent applications filed under 35 U.S.C. 111(a), the prior art dates under 35 U.S.C. 102(e) accorded to these references are the earliest effective U.S. filing dates. No benefit of the filing date of the foreign application is given under 35 U.S.C. 102(e) for prior art purposes (*In re Hilmer*, 149 USPQ 480 (CCPA 1966)). Accordingly, the effective prior art date of Hasegawa is its US filing date, Sept. 5, 2003.

Submitted herewith is a declaration under 37 CFR 1.131 establishing invention of the subject matter of rejected claims 1 and 4-7 and 9 prior to the effective date of the reference (Sept. 5, 2003). Therefore, Applicants respectfully request that the Examiner withdraw the rejection of claims 1 and 4-7 and 9 based on Hasegawa.

Reconsideration and allowance of claims 1 and 4-7 and 9 is respectfully requested.

Claim 8 has been amended to require that the free layer is formed directly on a layer of NiFe. This limitation is not found in Hasegawa. Reconsideration and allowance of claim 8 is respectfully requested.

HIT1P060/HSJ920030255US1

Claims 2-4, 11-20, 22 and 23

Claims 2-4, 11-20, 22 and 23 have been rejected under 35 USC 103(a) as being unpatentable over Hasegawa in view of Parkin.

Submitted herewith is a declaration under 37 CFR 1.131 establishing invention of the subject matter of rejected claims 2-4, 11-18 and 20 prior to the effective date of Hasegawa (Sept. 5, 2003). Per MPEP 715.02, Applicants may overcome a 35 U.S.C. 103 rejection based on a combination of references by showing completion of the invention by applicant prior to the effective date of any of the references; applicant need not antedate the reference with the earliest filing date. Therefore, Applicant respectfully requests that the Examiner withdraw the rejection of claims 2-4, 11-18 and 20 based on Hasegawa and Perkin. Reconsideration and allowance of claims 2-4 and 11-18 and 20 is respectfully requested.

Regarding claim 19, claim 19 has been amended to require that the free layer is formed directly on a layer of NiFe. This limitation is not found in Hasegawa or Parkin. Reconsideration and allowance of claim 19 is respectfully requested.

Claims 22 and 23 depend from claims 1 and 11, respectively. Claims 1 and 11 predate Hasegawa. Accordingly, because Hasegawa has been disqualified as a reference, claims 22 and 23 are believed to be allowable.

Claims 10 and 21

Claims 10 and 21 have been rejected under 35 USC 103(a) as being unpatentable over Hasegawa in view of Fuke et al. (US6455178).

Claims 10 and 21 depend from claims 1 and 11, respectively, and therefore incorporate the limitations of claims 1 and 11. Claims 1 and 11 are believed to be allowable over Hasegawa, as discussed in detail above. Accordingly, because Fuke has

HIT1P060/HSJ920030255US1

merely been added to show fcc CoFe, claims 10 and 21 are believed to be allowable over the proposed combination of art.

Claims 1-7, 9, 11-18, 22 and 23

Claims 1-7, 9, 11-18, 22 and 23 have been rejected under 35 USC 103(a) as being unpatentable over Mack et al. (US646291) in view of Parkin.

Applicants respectfully disagree that the combination proposed in the rejection would render the claims obvious.

The analysis of obviousness was set forth in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966). In order to establish a *prima facie* case of obviousness, three basic criteria must be met:

First, there must be some *suggestion or motivation*, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the teachings of the references. Second, there must be a reasonable *expectation of success*. Finally, the prior art reference or combined references must teach or suggest *all* the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success *must both be found in the prior art*, and not based on applicant's disclosure (*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991; emphasis added).

Applicants respectfully traverse the rejection of claims 1-7, 9, 11-18, 22 and 23 as failing the *Graham* test. Specifically, the combination proposed in the rejection fails the first and third elements of the *Graham* test.

Regarding the third element of the *Graham* test, Applicants respectfully point out that Parkin discusses antiferromagnetic (AFM) coupling, but nowhere discusses antiparallel (AP) coupling. Accordingly, it is unknown whether the many materials listed in Parkin are in fact suitable for AP coupling of ferromagnetic layers. What is known is that Parkin fails to state that the materials listed therein are suitable for AP coupling. Mack only discloses Ru as a material for an AP coupling layer. Accordingly,

HIT1P060/HSJ920030255US1

because use of an Ir AP coupling layer is not shown or suggested by the references, the rejection fails the third prong of the *Graham* test.

Regarding the first element of the *Graham* test, because Parkin fails to discuss AP coupling, or even suggest that the many materials listed therein are suitable for AP coupling, Parkin cannot suggest modification of Mack's Ru AP coupling layer. Accordingly, the rejection fails the first prong of the *Graham* test.

The rejection goes on to indicate that the AP coupling properties of Ir oscillates with increasing thickness, based on the oscillation in Parkin. The rejection points to Fig. 2 and Table 1 of Parkin to show Ir. However, this Figure and Table describe peaks in AFM exchange coupling, not AP exchange coupling between ferromagnetic layers. Accordingly, Parkin does not disclose that AP coupling oscillates based on thickness, and so cannot suggest a prescribed thickness of the AP coupling layer, much less the thickness of the AP coupling layer of claims 2, 3 and 11-18 and 23.

Nor has the Examiner provided a reasonable motivation based on knowledge generally available to those skilled in the art and not provided by Applicants in the present disclosure.

"To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

Here, the rejection indicates that Ir is a known equivalent to other known AP coupling materials, based on Parkin. However, as mentioned above, Parkin fails to disclose AP coupling. Thus, the only conclusion that can be drawn is that the combination of features proposed in the rejection has been impermissibly drawn from Applicants' disclosure.

HIT1P060/HSJ920030255US1

For any of the reasons set forth above, the combination of Mack with Parkin does not meet the *Graham* test, and the rejection is improper. Allowance of claims 1-7, 9, 11-18, 22 and 23 is respectfully requested.

Claims 8, 10, 19 and 21


Claims 8, 10, 19 and 21 have been rejected under 35 USC 103(a) as being unpatentable over Mack in view of Parkin and in yet further view of Fuke.

Regarding claims 8 and 19, claims 8 and 19 have each been amended to require that the free layer is formed directly on a layer of NiFe. This limitation is not found in Mack, Parkin or Fuke. Reconsideration and allowance of claims 8 and 19 is respectfully requested.

Claims 10 and 21 depend from claims 1 and 11, respectively, and therefore incorporate the limitations of claims 1 and 11. Claims 1 and 11 are believed to be allowable over Mack and Parkin, as discussed in detail above. Accordingly, because Fuke has merely been added to show fcc CoFe, claims 10 and 21 are believed to be allowable over the proposed combination of art.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 971-2573. For payment of any additional fees due in connection with the filing of this paper, the Commissioner is authorized to charge such fees to Deposit Account No. 50-2587 (Order No. HSJ920030255US1).

Respectfully submitted,

By:   
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HIT1P060/HSJ920030255US1

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**HIT1P060/HSJ920030255US1**

- 12 -